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THE ESTIMATION OF MINUTE QUANTITIES OF NITROGLYCERIN.*

By Wilbur L. Scoville.

From a medicinal point of view the estimation of nitroglycerin offers peculiar difficulties. This drug acts powerfully on the human system and is given in doses from 1/1000 to 1/20 grain. The most common form of administration is in tablets, and a method of determining the strength of these with accuracy is much to be desired.

For pharmaceutical purposes nitroglycerin is obtained in 10 per cent. alcoholic solution, which is practically a saturated solution, or in about 20 per cent. admixture with absorbent powders, as sugar of milk, chalk, talcum, etc., to which a little bicarbonate of sodium or carbonate of magnesium has been added for safety in shipping. There is evidence that both the solution and the powder-mixture deteriorate slowly. In cold weather a portion of the nitroglycerin will separate from the alcoholic solution, leaving the liquid weak unless the precaution is taken to warm and redissolve. Furthermore as L. H. Bernegua has pointed out [1] there is a loss in the process of manufacturing tablets of nitroglycerin, and the accuracy of the tablets is not therefore a question merely of mathematics and careful workmanship.

For the estimation of nitroglycerin in pharmaceutical preparations, two methods are in general use,—the nitrometer method, and titration after saponification with standard alcoholic potash. Of these the nitrometer method is undoubtedly the more accurate, and

* Read at the Indianapolis meeting of the American Chemical Society, July, 1911.

[1] *Amer. Jour. Phar.* 1907, page 555.

is probably the more used. For standardizing the stronger alcoholic solutions and the powder-mixtures (precautions being taken to exclude the carbonates present in the latter) it may give good results in skilled hands.

But the nitrometer requires experience in its use, and particularly for this substance. Newfield and Marx in an article on the use of the nitrometer[2] with special reference to the examination of nitrocellulose, a kindred body of nitroglycerin,—state that the sulphuric acid used must not be below 94.8% strength, the time of agitation not less than 3 minutes, and that the presence of other organic bodies may seriously affect the results. They say that "a great number of details, some of them apparently trivial, affect the results to a considerable extent." If we add to these the difficulty of weighing accurately and transferring completely to a nitrometer, so viscid a substance as nitroglycerin, without unduly diluting it in the transferring, it is not to be wondered at that one unacquainted with all of these necessary details should obtain results varying from 82% to 108% in half a dozen assays on the same sample, and become discouraged thereby, although accustomed to the nitrometer in the assay of ethyl nitrite. Hence the statement often made that "experience is necessary" in the use of the nitrometer for nitroglycerin assays, cannot be too strongly emphasized.

Furthermore for the estimation in tablets there are additional difficulties.

The method of estimating nitroglycerin by saponification with alcoholic potassium hydroxide has been proposed by several writers.

Mr. Hay states[3] that the decomposition of nitroglycerin by alcoholic potash is of a complex nature, the products being potassium acetate, oxalate and formate, free ammonia, etc. Nevertheless he offers an equation wherein 5 molecules of potassium hydroxide act upon 1 molecule of nitroglycerin to give the above, and proposes that equation as the basis of assay by titration with standard alcoholic potash and standard acid.

In 1895 Dr. Charles Rice recommended[4] the estimation of nitroglycerin by saponification with standard potassium hydroxide and standard acid, on the basis that the reaction products are simply potassium nitrate and glycerin. The high position and reputation

[2] *Jour. Amer. Chem. Soc.*, 1906, page 877.
[3] *Jour. Chem, Soc.*, 1885, page 742.
[4] *Amer. Drug. & Pharm. Rec.* July 10, 1895, page 6.

of Dr. Rice gave this process an immediate standing, and it has since been endorsed by several writers, notwithstanding that it was pointed out as early as 1868 by Tilberg [5] a Swedish chemist that the reaction between potassium hydroxide and nitroglycerin is not a simple but a very complex one, and results in nitrite, cyanide, oxalate and formate of potassium and free ammonia, and that in 1885 Mr. Hay reiterated this fact. The endorsements of this process, as well as Dr. Rice's own experiments appear to be based on the fact that *expected* results are frequently obtained by it, but without any proof that *expected* results were *correct* results.

In 1910, Berl & Delpy [6] stated that when cold alcoholic solution of potassium hydroxide is mixed with nitroglycerin, and the temperature kept under 25° C. for some time, the products of reaction are potassium nitrate, nitrite, cyanide, oxalate, mesoxalate and formate, aldehyde, ammonia, glyceryl dinitrate and glyceryl trinitrate—(some of the last remaining undecomposed). They further state that 6 molecules of potassium hydroxide are required to decompose one of nitroglycerin and that the reaction is not complete in the cold.

Here then there is one chemist (Hay) who says that one molecule of nitroglycerin requires 5 molecules of alkali, another (Rice) that 3 molecules of alkali are required, and a third (Berl & Delpy) that 6 molecules are necessary.

And one has only to try the process, varying the conditions of heating, the time of standing, and the temperature, to become convinced that the results are of no value.

Indeed one is surprised to note how much variation in results is induced by slight variations in the process.

In 1905, Binz [7] a Swedish chemist proposed to estimate nitroglycerin by saponifying it with alcoholic potash, reducing the nitrate, cyanide, etc., so formed to ammonia by treating the liquid with nascent hydrogen (formed by zinc and sulphuric acid added to the liquid) then estimating the ammonia, after distillation. In this process the nitrogen is first converted entirely into ammonia, and the latter estimated. This appears to be scientifically sound, and if conditions can be made to ensure complete reaction without loss of nitrogen in any form, it may give accurate results. The writer has not tried

[5] Proc. A.Ph.A., 1869, page 242.

[6] *Ber.* 43 1421 thro. Chem. Abst., 1910—2488.

[7] Year Book Pharm., 1906, page 53.

it. It suggests the Kjeldahl method of estimating nitrogen,—which the writer has tried on nitroglycerin with good results.

For pharmaceutical purposes the need applies particularly to an estimation of minute quantities, as in 1/100 grain tablets, etc.

The writer first attempted to use " nitron " for this purpose but the insolubility of nitroglycerin in water makes this impracticable.

The use of phenol disulphonic acid, as in water analysis for the estimation of nitrates, then suggested itself. On trial this worked well, and appeared to give excellent results. It then remained to ascertain whether such results were correct.

Since this reagent must be applied to a dry residue, the first question relates to the volatility of nitroglycerin, some writers having asserted that it is slightly volatile.

A (supposedly) 10% alcoholic solution was evaporated under three conditions, two samples of 10 c.c. each being used for each test.

No. 1 the alcohol was driven off on a steam bath, the residue being removed from the bath before the last traces of alcohol had disappeared, then dried in a vacuum desiccator.

No. 2 was subjected to a blast of warm air until the alcohol had been dissipated, then dried in a vacuum desiccator.

No. 3 was placed in a vacuum desiccator and the vacuum maintained during 60 hours.

The residues weighed:

No. 1	A = 1.030	(b) = 1.029	Gm.
No. 2	A = 1.0135	(b) = 1.0115	Gm.
No. 3	A = 1.027	(b) = 1.032	Gm.

On subjecting some of these residues to a moderate heat, as on top of a steam-bath, above and removed from a steam-bath, on warm sand, etc., they all lost weight with varying rapidity, while residues which were maintained in a vacuum in the desiccator and weighed daily, lost only 1.5 and 1.6 milligrams in 6 days. It was further learned that when in evaporating the alcohol by aid of a very moderate heat—(40° to 50° C.) if the residue was left in the heat after the alcohol had disappeared, the results were lower and were uneven. It appears therefore that *nitroglycerin is not volatilized even in a vacuum in ordinary temperature but that dry nitroglycerin is slowly decomposed by a very moderate temperature.* This sample of solution had a density of 0.8650 at 25° C. and tested by the Kjeldahl-

Gunning method gavė 8.642, 8.717, 8.732 and 8.822 per cent. of glyceryl trinitrate,—average 8.72 per cent. w.v. The evaporation method therefore gives high, though uniform results.

In operating the Kjeldahl-Gunning method there is trouble with frothing unless the alcohol is first driven off completely, a troublesome matter to operate without loss in a Kjeldahl flask. The precaution must also be taken to entirely dissolve the nitroglycerin in the acid before heating, a matter which requires a thorough shaking and a little patience, but avoids subsequent loss by minute explosions.

Tested by the phenoldisulphonic acid method this solution showed 8.3 per cent. w.v., which, considering the minute quantity used for this test, is very satisfactory.

Two other samples of the same order-lot of solution, but taken from different containers, were tested by the evaporation, Dumas, Kjeldahl-Gunning, and the colorimetric methods. The results follow:

Solution No. 2.	Spec. Grav. at 26° C. 0.8390.
Evaporation method	5.91 per cent. and 5.84 per cent. w. v.
Dumas (combustion) method	5.79 per cent. 5.85 and 5.84 per cent. w. v.
Kjeldahl-Gunning	5.82 per cent. w. v.

Solution No. 3.	Spec. Grav. at 25° C. 0.8536.
Evaporation method	8.83 and 8.85 per cent. w. v.
Dumas (combustion) method	8.534 per cent. and 8.545 per cent. w. v.
Kjeldahl-Gunning	8.42 per cent. w. v.

From each of these, dilutions were made to contain 1 gram of nitroglycerin in 100 c.c. of alcohol solution, at 20° C. calculated from the Dumas estimation, and these dilutions were tested by the colorimetric (phenoldisulphonic acid) method. Each of four solutions tested 1 gram in 100 c.c. colorimetrically.

This method therefore gives as accurate results as a colorimetric method may, and for the estimation of minute quantities is greatly to be preferred.

The method of applying the test is essentially the same as is used in water analysis. The standard solution of potassium nitrate was used as standard. This is made by dissolving 0.722 (0.7217) gram of pure fused potassium nitrate in sufficient water to make 1000 c.c. One c.c. of this solution contains 0.0001 gram nitrogen in the form of nitrate and 1.2 c.c. of this solution contains the same amount of nitrogen as 1/100 grain of pure nitroglycerin. Of the alcoholic solutions the equivalent of 0.00065 Gm. (or 1/100 grain) of pure

nitroglycerin (calculated) was measured into a small porcelain evaporating dish, and allowed to evaporate spontaneously. Into another dish was measured 1.2 c.c. of the standard nitrate solution and evaporated at a low temperature. When both were dry 2 c.c. of the phenoldisulphonic acid reagent were added to each, the mixture stirred well with a glass rod and allowed to stand 10 minutes, then diluted with water, rendered slightly alkaline with potassium hydroxide, cooled and diluted to 100 c.c.—or 200 mm. in the comparison tubes. The colors were then compared in a Schreiner colorimeter in the usual way.

If a colorimeter is not at hand, Nessler tubes will give very good satisfaction. In the colorimeter a difference of $^1/_{20}$ or 5 per cent. is easily discerned.

For tablets, five $^1/_{100}$ grain tablets are powdered, 10 c.c. of alcohol added and the mixture shaken frequently during 1 to 2 hours, then filtered.

Two c.c. of the clear filtrate is then evaporated and treated. Other strength tablets are treated similarly, the equivalent of $^1/_{100}$ grain being taken for test. If the tablets are easily friable they are broken up with a glass rod after adding the alcohol.

The test, so far as tablets are concerned was proven by adding a known alcoholic solution of nitroglycerin to varying quantities of sugar of milk, drying without heat then treating with alcohol as above and applying the test. The full amount of nitroglycerin put in was recovered by the test, except in one instance when an excessive amount of sugar of milk was used.

A sample of the U.S.P. Spirit of Nitroglycerin containing 1 per cent. by weight of nitroglycerin was made from solution No. 3.

The specific gravity of this at 25° C. is 0.81378. Ten c.c. of it made a clear mixture with 12 c.c. of water at 15° C., but 13 c.c. at this temperature produced a marked milkiness.

The present U.S.P. tests on this spirit allow so wide a range as to be of little value. The above sample has been kept six months and shows no change in strength.

VARIATIONS IN THE FORMS OF DIGITALIS HAIRS.[1]

By Henry Kraemer.

While considerable attention has been given in a general way to the pharmacognosy of digitalis, these studies have for the most part aimed to differentiate digitalis from other leaf drugs which may have been occasionally substituted for the genuine drug. As a matter of fact the adulteration of this drug or its substitution is very rare indeed. When we consider that digitalis has been used in medicine for some 400 years and see the conflicting statements that are still made regarding the efficiency and deterioration of the drug and its preparations, we may well ask how much progress has been made in the solution of the problems which this drug with its complex constituents presents. It is true that we have methods for the biological standardization of the drug and its preparations but these do not enable us to determine in advance which lot of drug will, in a given instance, be found valuable and which will be of inferior quality. It is not too much to claim that no work on such an important drug as this will be complete until we can determine either by chemical analysis or through pharmacognostical studies the differences between different samples of drug. One thing that is needed, then, owing to the complexity of the chemical constituents, is more or less extended work in conjunction with pharmacological tests having in view a closer differentiation of the physical and microscopical characters of the specimens examined. It is true that we have in the various pharmacopœias such statements as, that the leaves only of the second-year plant shall be used, and at the present time there is a tendency to require that the leaves shall be thoroughly dried and kept in containers with freshly burnt lime. But we find that recent investigations tend to show that the leaves of the second-year plant are relatively but slightly more potent. And again, we know that certain practitioners use only the tincture of the fresh drug. Furthermore, there is a tendency in many quarters in spite of the restrictions in many pharmacopœias that the leaves only of wild plants shall be used, to employ the leaves of cultivated plants, and

[1] Presented at a meeting of the Pennsylvania Pharmaceutical Association, June, 1911.

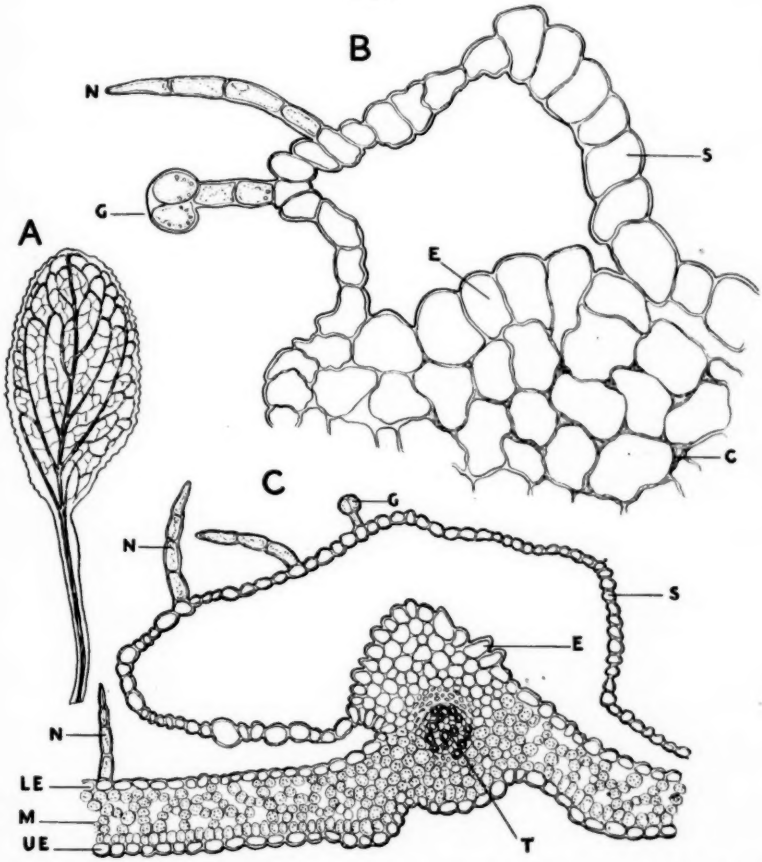
this is the practice of many discriminating pharmacists in the United States.

Of all the papers which have been published on digitalis, the one by Hartwich and Bohny [1] seems to me to be the most important from a pharmacognostical standpoint. The whole work is of a basic character and sets forth many observations showing variation in the structure of wild plants and those selected from cultivated varieties. These authors point out that among other things that the leaves of wild digitalis are usually more hairy, that the cells of the hairs are shorter and broader and that the cuticle, or outer walls, of the middle and lower cells of the non-glandular hairs are finely papillose. Vogl [2] has called attention to the fact that the end cells are occasionally either fine striated or slightly papillose. As a matter of fact the observations of both of these authors are correct. In regard to the number of cells making up these non-glandular hairs, Vogl states that they are mostly 3-celled, Hartwich and Bohny state that they are usually 2- to 4-celled and seldom 5- to 6-celled, and Greenish [3] records the fact that exceptionally they may be as many as ten cells long. While I have not been able to confirm Greenish's observation, I have seen specimens in which many of the hairs were 7 to 8 cells long, and I believe that his statement can be confirmed. Most authors agree that the head or glandular portion of the glandular hair consists of one or two cells but Hartwich and Bohny state that they are seldom 1- or 4-celled. The stalks of these glandular hairs are usually 1- or 2-celled. A most interesting observation is recorded by Hartwich and Bohny that in between the veins occur long glandular hairs with usually a 4-celled stalk and a 1-celled glandular head. These observations are all of the very greatest interest and should be borne in mind by students and practical workers in pharmacognosy.

The entire leaf of digitalis is very characteristic, being more or less elliptical and the lower portion extending into the petiole (Fig. 1). The margin is irregularly crenate but the most characteristic feature is the venation. From the central vein extend a number of prominent veins of the first order that diverge at angles of twenty to forty-five degrees, which serves to distinguish it from inula, in which the angles between the primary veins and the mid-rib are from sixty-five to nearly eighty degrees. The venation at the teeth is also considered by many authors [4] to be rather characteristic for digitalis. While the commercial drug will yield

in some instances nearly entire leaves it is for the most part made up of broken fragments and the microscopical study of these fragments is of the very greatest interest. There are a number of

FIG. 1.

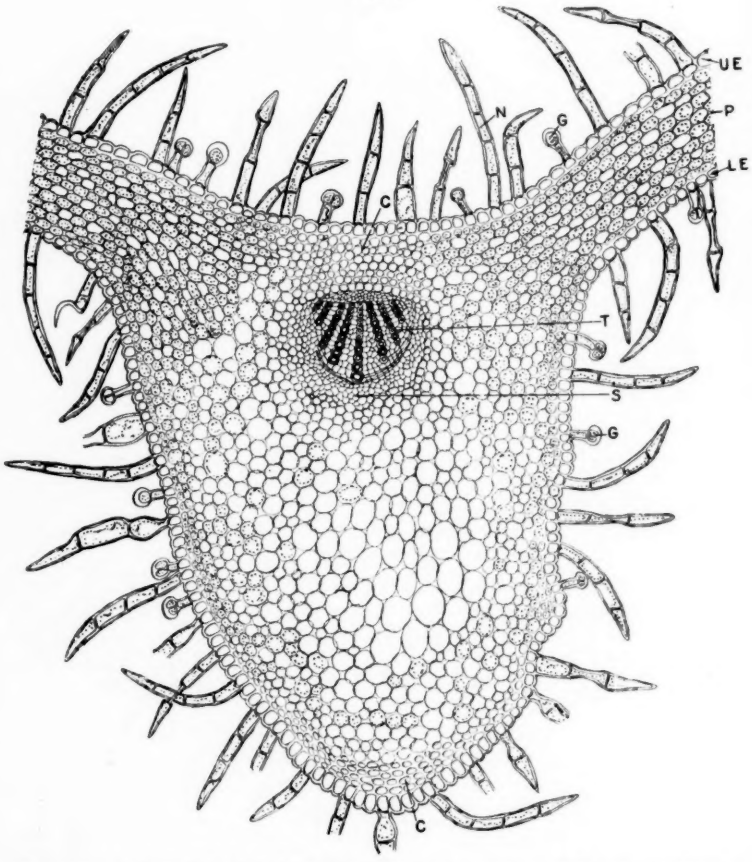


Digitalis: *A*, a typical leaf showing the winged or laminate petiole and the veins of the first order which diverge from the mid-vein at very acute angles. *B*, transverse section of portion of leaf showing the separated or additional epidermal layer (*S*); epidermal layer (*E*); glandular hair (*G*); non-glandular hair (*N*); collenchyma (*C*). *C*, transverse section near one of the veins showing considerable of the separated or extra epidermal layer (*S*); with two non-glandular hairs (*N*) and glandular hair (*G*); epidermal layer (*E*); lower epidermis (*LE*); chlorophyll layer (*N*); upper epidermis (*UE*); tracheæ or vessels (*T*).

characters in the anatomy of this leaf that might be studied, but I desire at this time to call attention only to certain variations of the hairs observed in different specimens of the commercial drug as also of the cultivated plants. It is well known that in the hairs

of many plants active principles are contained. For instance the volatile oils yielded by the Labiatæ are found in the glandular hairs of the plants comprising this family. The stinging hairs of the nettles are peculiar in structure and while of a non-glandular char-

FIG. 2.



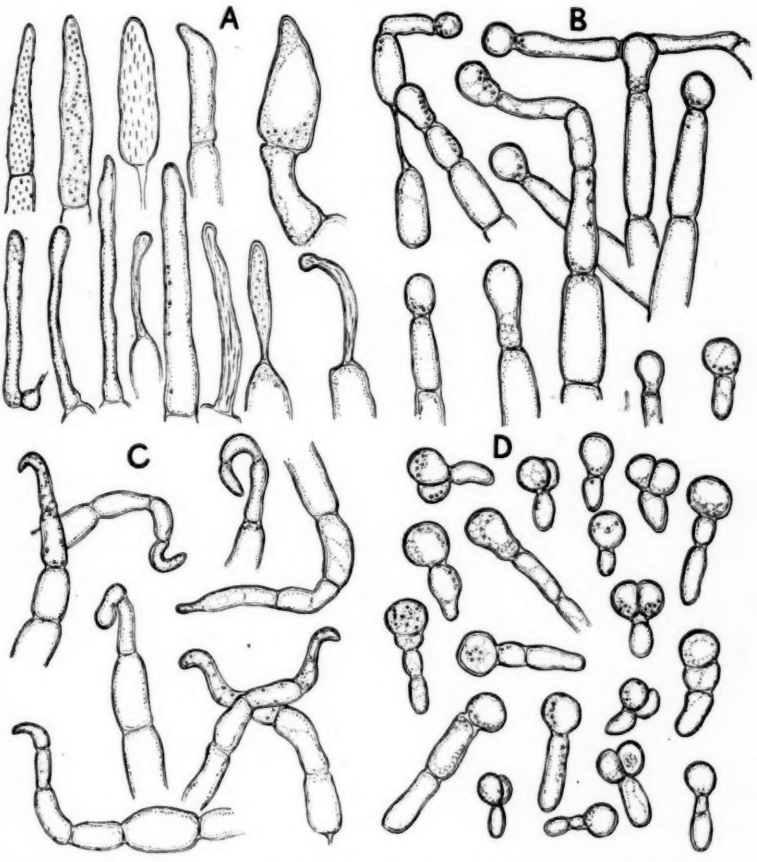
Transverse section of digitalis leaf, through one of the veins: *UE*, upper epidermis; *P*, chlorenchyma (mesophyll), containing chloroplastids; *LE*, lower epidermis; *G*, glandular hairs *N*, non-glandular hairs; *C*, collenchyma; *T*, tracheæ or vessels; *S*, leptome or sieve.

acter yet they contain irritating substances. Nothing appears to be known with regard to the nature of the secretory substances in the hairs in digitalis yet the fact that in certain specimens we find a preponderance of glandular hairs is suggestive that whether these substances are toxic or not or have any influence upon the action

of the cardiac substances it may be that the minute study of the hairs will throw some light on the variation in the drug.

As has been already stated there are two general types of hairs in digitalis, (1) non-glandular; (2) glandular. Usually the former

FIG. 3.



Various forms of hairs of digitalis: *A*, various forms of apical cells; *B*, long stalked glandular hairs very common in leaves of cultivated plants; *C*, various non-glandular hairs showing crooked or bent apical cells; *D*, various forms of glandular hairs with short stalks.

occur in greatest number but the reverse is frequently the case, especially in cultivated garden varieties. In fact I have seen in certain instances the glandular hairs so numerous that I was inclined to think that the observations previously reported and the illustrations made were erroneous. The non-glandular hairs are usually

2- to 5-celled and vary in length from 145μ to 435μ. The cells are quite slender, being 9 to 13 times as long as broad. In other cases they are much shorter and broader, being twice as long as broad. The apex is usually obtuse or slightly rounded, and seldom acute. (Fig. 3, A.) In some specimens the end cell is characteristically curved or crooked (Fig. 3, C). Again the end cells of these long hairs may be nearly spherical and of a glandular character (Fig. 3, B).

The glandular hairs in the crude drug found on the market usually possess a short 1-celled stalk and a globular glandular head consisting of one or two cells (Fig. 3, D). In some specimens these are relatively few, or wanting entirely, while in other specimens they are quite numerous, being about 25 to the square millimeter. The greatest interest is in the long-stalked glandular hairs (Fig. 3, B), which, in some specimens of leaves from cultivated plants, largely replace the long non-glandular hairs. One may count upon a single cross-section about one half millimeter long, one complete non-glandular hair; three long-stalked glandular hairs; the basal cells only of nine hairs, and eleven short-stalked glandular hairs. The impression that one receives from seeing slides of this character is that the hairs of digitalis are chiefly of the glandular type.

One of the most unusual characters which has been observed in certain specimens of crude drug, has been the formation of an extra epidermal layer. It would be interesting to know the potency of preparations made from a drug of this kind. In presenting this paper at this time I have done so in order to call attention to the fact that the pharmacognostical study of this drug has by no means been exhausted. What is probably needed here is some statistical work in regard to the occurrence of the several types of hairs and their relative distribution in different specimens of the drug the pharmacological efficiency of which is being determined.

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[2] August v. Vogl: Kommentar zur achten Ausgabe der Österreichischen Pharmakopöe, 1908, p. 91.
[3] Henry George Greenish: The Microscopical Examination of Foods and Drugs, 1910, p. 136.
[4] A. Tschirch and O. Oesterle: Anatomischer Atlas der Pharmakognosie und Nahrungsmittelkunde, Lief. **15**, p. 319.

THE PREPARATION OF NEUTRAL SUSPENSION OF SALVARSAN.[1]

By George M. Beringer, Jr.

The directions for preparing the neutral suspension of salvarsan, as given in the literature accompanying the product, are, apparently, very simple and require but little time for carrying out; but therein lies a trap. The modified method given herewith has been found to yield a satisfactory product.

The apparatus and material required are very simple. There will be needed:

One or two beaker glasses (25 or 30 c.c.),
One cylindrical measure (10 c.c.),
Two thin glass rods with rounded ends,
One glass mortar (30 or 60 c.c.),
Three pipettes made from tubing of small diameter,
One or two ampoules (5 or 10 c.c. capacity),
One funnel with slender stem.

It has been found advantageous to keep these in a seamless tin box with tightly fitting lid. This is sterilized in a gas oven at a temperature of 200° C. for fifteen minutes and allowed to cool before using.

In addition, the following should be prepared, in previously sterilized containers:

50 c.c. 15 per cent. solution sodium hydroxide (in glass-stoppered bottle),
25 c.c. solution hydrochloric acid (1 part diluted HCl, 3 parts sterile water, in glass-stoppered bottle),
200 c.c. distilled water (contained in a flask and sterilized by boiling for 15 minutes),
Phenolphthalein test paper.

Salvarsan is sent into the market in sealed ampoules containing .6 Gm. The entire amount is generally made into suspension, the physician dividing the dose, if need be, when administering. It is, as you are probably aware, in the form of a hydrochloride. This is readily hydrolyzed by water, so that aqueous solutions contain free acid, which makes them objectionable for injection. While it is

[1] Read at the meeting of the New Jersey Pharmaceutical Association, June 14, 1911.

soluble in alkaline solutions, they are exceedingly painful when injected; hence the need for a neutral suspension of the base itself.

The material having been prepared, as previously directed, the ampoule containing the drug is washed with water and, finally, with alcohol. This is necessary because they are generally badly smeared with glue. The ampoule is then opened and emptied immediately into the mortar. Fifteen or sixteen drops of the soda solution are added and mixed with the material. Then enough distilled water is added, drop by drop, to make a moderately thin paste. Great care must be taken, from this point to the end of the preparation, to thoroughly triturate the material. Every particle must be rubbed till a smooth, creamy mixture results. It is now to be tested for alkalinity by applying a small portion of the mixture, by means of one of the rods, to a piece of phenolphthalein paper. If not faintly alkaline add soda solution, drop by drop, with continued trituration, till it gives the reaction, adding sterile water, from time to time, if the preparation becomes too thick. Now the HCl solution is added, drop by drop, till the mixture just ceases to react upon the test paper. Great care must be taken to rub up any cheesy lumps that may form when the acid is added. More water is added and the mixture transferred to the graduated cylinder. The portions of the precipitate adhering to the sides of the mortar and the pestle are rinsed down with the aid of a glass rod and sterile water, dropped as needed, and added to that in the cylinder. Enough water is added to make the product measure 8 c.c. and the mixture transferred to the ampoule by means of the funnel. Two c.c. of water are now used to rinse the adhering material from the measure and funnel into the ampoule. The excess of stem is filed and broken from the ampoule, which is immediately sealed by a blow-pipe flame directed across the edge of the open tube till the glass is perfectly fused. After cooling, the container is shaken to insure mixing.

Many physicians make the injection at two sites, using the suspension in portions of 5 c.c each. For this purpose, a beaker glass will be needed in dividing the preparation. An extra beaker is provided because the operator frequently has immediate need of an extra vessel of some kind in the midst of his work.

It is better to have a large mortar than one too small, as the precipitate can be more easily rubbed smooth in the former. A porcelain dish as directed in the circulars is exceedingly unsatisfactory.

The hydrochloric acid is directed to be much more dilute than that originally used, as it has been found to give a lighter and a finer precipitate.

The suspension should not be prepared long before it is to be used. At least an hour, however, should be allowed for its preparation, and the operator should, under no circumstances, be hurried. The services of an assistant to handle the pipettes will materially shorten the time required.

Phenolphthalein paper is much more certain in determining the reaction than litmus. Red litmus does not change till a great excess of alkali has been added. Blue litmus is more sensitive but not so sharp in distinction as phenolphthalein. When neutral to the latter, the preparation slightly deepens the color of blue litmus. This seems to be the proper "end point," as, when more acid is added till just neutral to litmus, the suspension of the precipitate is not so perfect.

SOME THOUGHTS ON THE ACTION OF THE ENZYMES, WITH SPECIAL REFERENCE TO THE NATURE OF PEPSIN.[1]

By James E. Hancock.

Ever since the discovery of the enzymes, physiological chemists have tried to explain the transformations that occur under their influences and to systematically reason why these changes should be. One theory and then another has been suggested, each of which has been based upon certain peculiarity of reaction that has happened under the particular investigator's notice. The study is fascinating because metabolism generally is a physiological process that cannot be even approximately understood until the actions of enzymes are comprehended. Every problem in the growth and dissolution of plants and animals, and especially in the transferences of energy, is connected in some way or other with the action of enzymes. Plants, with very few exceptions, acquire their food from the soil and from the air. By the action of enzymes under favorable influences of light, heat and moisture, the organic materials that are thus absorbed are elaborated into complex compounds, consisting

[1] Read at a meeting of the Maryland Pharmaceutical Association, June, 1911.

mostly of carbon, hydrogen, oxygen and nitrogen, and build up within themselves the sugars and vegetable proteids, which in turn are so necessary for the growth and maintenance of the animal kingdom. For a long time it was believed that all proteids were the products of vegetable life, but when the differences between the various complex albumins were studied, it was seen that the albumins found in animals were different from the albumins found in plants, and it is now known that no matter from what source the animal takes its food, the proteids have to be catalyzed before they are fit for its economy.

Digestion in itself is an extremely simple word, but it is very comprehensive, and few realize how much is included in the process. Some authorities consider enzyme actions as a part of the vital processes themselves, but others evidently cannot see beyond the material reactions that occur, until even in these days of advanced science no acceptable agreement is absolutely settled upon. The subject is necessarily a theoretical, indeed an obscure inquiry. In recent years a dynamic conception of the powers seems to be more and more acceptable and at least two advocates of such explanation would appear to approximate a reasonable theory for these processes. Naegeli assumes that catalysis is induced by vibratory action, and, apropos, it might be well to remind you that it is a generally accepted hypothesis to consider that the atoms of every molecule of matter are never at rest, but that they vibrate in a state of equilibrium which is consistent to the maintenance of its specific whole. It is supposed that the catalyzing agent—the enzyme—coming in contact with a body favorable to its action, communicates the vibrations of its atoms to the atoms of the molecules of the body that is being digested and breaks down their staple tension with a natural reduction of its complexes into other and simpler compounds. To get a better appreciation of what this atomic rearrangement may mean, we must remember that Grubler has estimated that the molecular weight of vitellin was 8848, from which was deduced the formula $C_{292}H_{481}N_{90}O_{83}S_2$, and that Sabanejeff has determined that the molecular weight of ovalbumin was 15,000. The atomic rearrangement in the changes that might occur in such complexes, especially if modified or interfered with by external factors and inequalities would suggest a procession of geometric possibilities. The dynamic law of Laplace and Berthollet " That an atom or molecule put in motion by any power whatever may communicate its own

motion to another atom or molecule in contact with it," would thus seem to acquire a special significance in the biochemistry of the enzymes and might account for the many catalyses and syntheses that occur in our own bodies and in growing plants and animals, under the actions of enzymes when influenced by the sun's rays and other favorable conditions. Ostwald's generalization practically implies the same character of action when he states that these changes are brought about by the increased activity of molecular movement.

Accepting either or both of these theories, even with modifications, they at least reconcile the transformations that may occur in the phenomena of digestion as a peculiar quality of the enzymes, the smallest particles of which may be assumed as being in a state of motion, a state which is communicated to the atoms of the material that is being digested and with which they are in contact, thereby causing the atoms of the molecules of this matter to change their position and rearrange themselves in new groupings. Supplement this induced rearrangement with the processes of either oxidation or hydration, dependent of course on the peculiar quality of the particular enzyme, and then carry this conception a little further and infer the action of disturbing external factors like heat or light, which are vibratory in their communications,—for it is entirely possible that the waves from these may intensify or abnormalize this existing process,—and the products that are thus formed must necessarily alter with the temperature and the other modifications of transformation in which the enzyme works, because the changes in the newer bodies are the result of these imparted energies and the atomic rearrangement that is thus brought about must stand in particular relation to the manner of the actions. During the past winter my attention was called to an auto-digestion of pepsin that could only be reconciled by this reasoning, and an experimentation of several months with recurring resultants under similar conditions has been an interesting problem. As we all know, pepsin is an extremely sensitive body, and the best chemists have never been able to analyze it. We all know it is a soluble, unorganized ferment that differs in its mode of action from living ferments such as yeast and bacteria, in that it possesses no power of self-nutrition and multiplication. Like all other animal extracts it is surrounded by the limitations that nature has placed upon it. It will bear an exposure to a prolonged low temperature without being injured, and it is active only in weak acid solutions, and then

when accompanied by two conditions—the presence of water and heat. Nature's economy provides that it shall be physiologically active at and about 100° F., while an exposure of its simple solution to a temperature of 130° F. will quickly destroy its proteolytic activity. Moreover, its digestive activity is always dependent on the medium in which it is exhibited. The U.S.P. requires that one grain of pepsin shall be able to digest 3000 grs. of coagulated egg albumin when suspended in a 0.2 per cent. HCl solution with water. By repurification this standard may be increased to a much higher potency; but even in the highest degree of purification that it has yet been obtained, it is at least in combination with nucleo-proteid bodies. These nucleo-proteids are combinations of nucleic acid with albumin. Recently several authorities have advanced the theory that the nucleo-proteids themselves are the enzymes. This is especially urged by Haliburton, and Pekelharing has practically arrived at the same conclusion and suggests that the nucleo-proteid is probably the zymogen of the enzyme. This hypothesis is strengthened by the observations of McCallum, who showed that in nature the nucleus initiates the process of secretion and excretes some material into the cytoplasm which then undergoes further changes and ultimately enters into the zymogen, if indeed it does not actually form the principal part of it. Nencki and Sieber also state that pepsin contains nucleo-proteid and conclude that the zymogen—pepsinogen—is converted into pepsin by combining with the nucleo-proteid of the cell. The practical results of pepsin digestion of nucleo-proteids have been frequently demonstrated. Although they are much more resistant to hydrolysis than the true albumins, nevertheless under a prolonged peptic digestion, the nucleo-proteids are split into nucleins, being new compounds of nucleinic acid and protein fractions.

A series of experiments in which pepsin and its natural associates were the only possible albuminous quantity present, in an acidulated solution under the action of heat and electric light for ten days, have given the following results: A precipitation of modified nuclein that is insoluble in the acid medium and a propeptone moiety that remains dissolved in the solution. I wish that I were prepared at this time to give you the ultimate results, but certain conditions will not permit. The purpose of this paper is only to urge that pepsin solutions should be kept in a cool, dark place, because of their sensitiveness to heat and light.

A NEW VEGETABLE ADULTERANT.

(OUTER LAYERS OF THE PERICARP OF THE FRUIT OF JUGLANS REGIA L.)

By Henry Kraemer.

At the Pharmaceutical Meeting of the Philadelphia College of Pharmacy held November 16, 1909, Mr. E. H. Gane exhibited a sample of "vegetable shells," which he stated were imported probably for the purpose of replacing walnut shells, olive pits, etc., owing to the ease with which these latter products can now be detected when used as adulterants. (See *Am. Jour. Pharm., 81,* p. 597, December, 1909.)

A preliminary examination of the sample showed that it was composed of the pericarp of some fruit. I then gave the sample to one of my students, Mr. Peter Amsterdam, to study microscopically and in comparison with the pericarps of similar fruits in our collection. This study showed that the material consisted of the hulls, or outer layers of the pericarp, of the fruit of *Juglans regia,* or English walnut, the nuts of which are common in the markets as an article of food.

The hulls (outer portion of the pericarp) of the fruit of *Juglans regia* have been used in the fresh and green condition in medicine, and are described in foreign works under the name of *Cortex Fructus Juglandis* (*Cortex nucum Juglandis viridis. Grüne Walnussschalen. Brou de noix*). The hulls are described by Vogl in his Pharmacognosy, and a rather extensive article on their histology is given by Hartwich in the *Archiv der Pharmacie, 66,* p. 325 (1887).

Macroscopic Characters.—The dried hulls, or "shells," consist of pieces or fragments composed for the most part of the outer layers of the pericarp, *i.e.,* the epicarp and sarcocarp. The pieces are more or less irregular, involuted, shrivelled, vary from 5 to 35 mm. in diameter, and break with a short fracture. Some of the pieces are marked by the stem-scar or still have attached to them portions of the stem. Externally, the epicarp, or outer layer, is rather smooth, though coarsely wrinkled, marked by numerous small dots, and varies in color from light to dark brown. The sarcocarp, or inner layer, is somewhat spongy, dark brown or black-

ish-brown in color, and more or less fibrous, due to the shrinkling of the parenchyma from the fibrovascular bundles.

The taste of the hull is markedly acid and somewhat bitterish, but the odor is not very pronounced or characteristic.

Microscopic Characters.—The epicarp shows the presence of numerous broadly elliptical stomata (Fig. A) which are from 50 to 70 microns in length; the opening between the guard-cells is large, and sometimes irregular in outline, or the guard cells may be separated along the adjoining walls, due to the unequal development of the tissues. The blackish-brown spots, which mark the outer surface of the epicarp are made up of tannin-containing cells which appear to be under the influence of a local stimulus of some kind, the area affected being 0.2 or 0.3 mm. in diameter. The epidermal cells are more or less polygonal, the cuticle being from 2 to 5 microns thick (Fig. B, e). Beneath the epidermis are two to three rows of tabular cells, usually containing a reddish-brown or tannin-containing sap (Fig. B, c); beneath these sub-epidermal cells is a continuous ring or zone (Fig. B, s) made up of three or four layers of stone cells, the walls of which are strongly lignified, lamellated, and finely porous. The cells vary from tabular to irregular, and may or may not contain a reddish-brown tannin-like substance, the tannin being in the cells of the specialized areas already described.

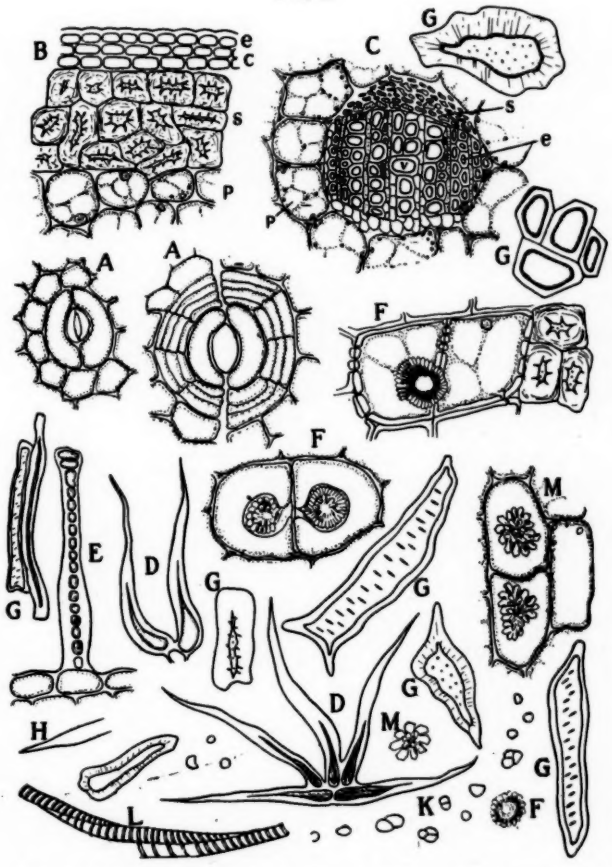
Beneath this zone of stone cells occur the tissues of the sarcocarp proper (Fig. B, p). This portion consists of parenchyma and fibro-vascular tissue. The cells of the parenchyma contain small starch grains and occasionally rosette aggregates of calcium oxalate which vary in diameter from 25 to 40 microns, and sometimes may be found in large numbers in the parenchyma cells adjoining the fibrovascular bundles.

The parenchyma cells of the sarcocarp of the young fruits have very thin walls, but in the older fruits the walls of very many of the cells become lignified and have large oblique pores. The tracheæ are in radial rows two cells wide separated by medullary rays one cell wide. They are usually spiral.

At both the apical and basal portions of the fruit occur curved, spear-shaped, unicellular, non-glandular hairs (Fig. D) resembling those found in the pericarp of the cereal grains, but distinguished from the latter by the fact that they are frequently united to form stellate groups resembling

those of kamala and those occurring on the leaves of hamamelis. The contents may be nearly colorless or consist of a reddish-brown tannin-like substance. There are also

FIG. 1.



Pericarp of fruit of *Juglans regia*: *A*, stomata of epicarp; *B*, cross-section of pericarp; showing epidermis (*e*), cells with reddish-brown contents (*c*), sclerotic cells (*s*), parenchyma (*p*), containing protoplasm and starch grains; *C*, mestome strand of the sarcocarp showing vessels (*v*), libriform (*e*), leptome (*s*), parenchyma containing protoplasm and starch (*p*); *D*, non-glandular hairs from the apical and basal portions of fruit; *E*, glandular hairs from base of fruit similar to those found in large numbers on the surface of the butternut (*Juglans cinerea*); *F*, rosette-aggregates resembling the membrane crystals of Rosanoff; *G*, sclerotic cells found in the powder; *H*, fragment of non-glandular hair; *K*, starch grains from 2 to 10 u in diameter; *L*, tracheæ with annular markings; *M*, calcium oxalate crystals.

present, usually at the base of the fruit, and also on the stems, when these are present, long-stalked glandular hairs (Fig. E) similar to those covering the fruit of *Juglans cinerea* (Butternut).

While the stalk is long and multicellular in the hairs of both species, the glandular head in the hairs of *Juglans regia* appears for the most part to consist of one or two cells, whereas in *Juglans cinerea* it is usually multicellular, resembling the glandular heads of the hairs of the *Labiatæ*.

In the parenchyma cells of the basal portion of the hull there are a large number of rosette aggregates or spherites of crystals resembling crystals of calcium oxalate (Fig. F). These aggregates are more or less hollow, frequently attached to the cell-wall, sometimes more or less enclosed by the cell-wall, and thus resemble the membrane crystals of Rosanoff (see Kraemer's Botany and Pharmacognosy, 4th ed., p. 171). These aggregates differ from those found in the stem, which are the typical rosette aggregates of calcium oxalate, and are deserving of special study.

Characteristics of the Powder.—The color is dark brown or blackish-brown, the odor faint, and the taste distinctly acid and slightly bitter. The most characteristic elements of the powder are the stone cells (Fig. G), some of which contain only air, thus resembling those of the olive pit, and some of which have a reddish-brown content. There occur besides fragments of the stalks of the glandular hairs (Fig. D), fragments of the non-glandular hairs (Figs. D and H), small starch grains (Fig. K), the two types of rosette aggregates of calcium oxalate crystals (Figs. F and M), and large, thin-walled somewhat shrunken parenchyma cells, many of which contain either small starch grains or reddish-brown masses, or cells with rather thick walls having large simple pores and being more or less lignified, approaching stone cells. These latter sometimes contain the Rosanoff crystal aggregates already mentioned.

When the hulls of *Juglans regia* are treated with water the solution soon shows a reddish-brown color which becomes much deeper on the addition of aqueous solutions of the alkalies. The aqueous extract of black pepper hulls, and black walnut shells (endocarp) has a color similar to that of the hulls of *Juglans regia* and behaves similarly toward solutions of the alkalies. The aqueous extract of pecan shells (endocarp) is of bright red or cherry red color, but becomes on the addition of alkalies of a dark reddish-brown color similar to that of the extract of the hulls of *Juglans regia*. Cloves give a reddish-yellow aqueous extract which becomes deep red on the addition of solutions of the alkalies. The aqueous ex-

tracts of the following, are either nearly colorless or range from a pale yellow to a pale yellowish-red, or pale olive green; and are not turned to a dark reddish-brown on the addition of alkalies: Black pepper, white pepper, Ceylon cinnamon, Cassia cinnamon, Saigon cinnamon, pimenta, ginger, English walnut shells (endocarp), olive endocarp (olive pits), peanut shells, Brazil nut shells (seed coat), and butternut shells (endocarp).

HARVEY WASHINGTON WILEY.

On Thursday, July 13th, the readers of the daily press were surprised to learn that the Committee on Personnel of the U. S. Department of Agriculture, consisting of Assistant Secretary Willet M. Hays, Solicitor George P. McCabe, and Chief Clerk C. C. Clark, had been "investigating a charge that Dr. Wiley and Dr. Kebler have exceeded their authority under the law in employing Dr. Rusby, and have recommended that Dr. Wiley be permitted to resign; that Dr. Kebler be put in a place where he will no longer have power to make recommendations as to employment of experts, and that Dr. Rusby be dismissed."

Scarcely anything short of an attack upon the country by a foreign foe could have so stirred the hearts of the American people generally. Dr. Wiley has published so many papers, has delivered so many public addresses, and has himself been the subject of so many interviews, that he, as a matter of fact, has been in the "limelight" continually. Furthermore, he is so genial, he is such a good speaker, he is so considerate of the welfare of the people that he may very properly be termed one of "America's leading citizens." Since the passage of the Federal Pure Food and Drugs Act he "has wielded more power than almost any other subordinate official of the Department of Agriculture. He was the prime mover in all the pure food legislation that has been enacted, and has been charged with the execution of the law under the direction of the Secretary of Agriculture. Practically single-handed, he has waged a vigorous fight against the adulteration of foods entering into domestic and foreign commerce and has presented an uncompromising front to every attempt to evade or let down the strict letter of the law."

To prepare a sketch of Dr. Wiley and his work would be to write a volume. Briefly then, Dr. Wiley was born on October 18, 1844, near Kent, Jefferson County, Indiana. In 1863 he entered the freshman class of Hanover College, graduating A.B. in 1867. Entering upon the study of medicine in 1868, he graduated M.D. from the Indiana Medical College in 1871. During his medical course he was instructor in Latin and Greek at Butler College. In 1872 he entered the Lawrence School of Harvard University, graduating B.S. in 1873. He was Professor of Chemistry at Butler College in 1873-4, and from 1874 to 1883 he filled the position of Professor of Chemistry at the Agricultural College of Indiana at Purdue. During this period he had leave of absence for the year 1878-79 and studied in Germany. He was State Chemist of Indiana from 1881 to 1883; was made Chief of the Division of Chemistry, U. S. Department of Agriculture in 1883, which position he held up to 1901, when he became Chief of the Bureau of Chemistry, which position he holds at the present time.

The record of Dr. Wiley's connection with the evolution of the Federal Food and Drugs Law and legislation concerning Foods and Drugs in the United States, is, indeed, a stimulus to any young man with a laudable ambition. It is the successful record of a man with an ideal, who has worked indefatigably until his ideal became a reality. And, furthermore, like other men who have achieved great things for their countrymen, we find a cabal seeking to humiliate him. It is now just a quarter of a century ago that Dr. Wiley, as Chemist, submitted to Hon. N. J. Colman, then Commissioner of Agriculture, the first Bulletin (No. 13) on Foods and Food Adulterants. This Bulletin deals with dairy products only, but was rapidly followed by other detailed scientific studies on other products, as spices and condiments, fermented alcoholic beverages, lard, baking powders, sugar, molasses and syrups, tea and coffee, canned vegetables, cereals and preserved meats. At the very beginning Dr. Wiley realized that the support of the public who eat the food would be vital to the propaganda, for in 1889 he submitted Bulletin 25 of the Bureau of Chemistry to the Hon. Jerry M. Rusk, then Secretary of Agriculture, entitled "A Popular Treatise on the Extent and Character of Food Adulteration." In submitting this report by Special Agent Wedderburn, Dr. Wiley said:

"The object of the present bulletin is wholly distinct from that pursued in Bulletin No. 13. The investigations, of which the present bulletin is the

result, were undertaken for the purpose of collating in popular form well authenticated facts respecting food adulteration, in order that the people and Congress might have at least a general view of the evil which it is hoped Mr. Wedderburn's work may help to remove."

Mr. Wedderburn states in this Bulletin: "Enough will be found, I am convinced, in the pages of the following report to emphasize in the strongest manner the necessity for such national legislation as was sought during the last session of Congress by Messrs. Conger and Laird of the House Committee on Agriculture, as expressed in their very able report, as submitted to Congress by order of that committee."

Some of the data in these pioneer reports are especially interesting in view of later developments. "Glucose is probably the leading adulterant on the market. It is largely used in syrups, low-grade sugars, jellies, and cheap confections. Druggists, wholesale and retail, had none, but with singular unanimity referred the inquirer to the candy manufacturers who, to a man, knew nothing of the commodity. Parenthetically, a specimen of taffy of another kind, abstracted from an inviting pile, yielded 79 per cent. of glucose on analysis." (Beckwith, Ohio State Board of Health.) Pickles, greened with sulphate of copper, adulterated spices, vinegars, canned foods, maple products, etc., all clamor in these pages for the attention that they have recently received in the notices of court judgments issued from the Department of Agriculture.

One bill followed another, and in every Congress from the Fiftieth (1887) on a food bill was reported to each House. As chairman of the Committee on Legislation of the National Pure Food and Drug Congress, called in 1898, and as a witness every year before the Congressional committees considering these bills, Dr. Wiley has been indefatigable in his advocacy of pure food and drugs for the people, backing up his views with the scientific work of the Bureau of Chemistry on the one hand, and with popular education on the other.

The study of imported foods was begun in 1898. Samples of a number of classes of foods were procured from the Custom officers at the various ports of entry and their quality and composition compared with similar food products purchased upon the open market alleged to be imported. The results were very interesting. On March 3, 1903, Congress in the Appropriation Act authorized the Bureau of Chemistry to supervise the importation of food

products. This law became effective July 1, 1903. The act authorizing this work reads as follows:

"To investigate the adulteration, false labelling, or false branding of foods, drugs, beverages, condiments, and ingredients of such articles, when deemed by the Secretary of Agriculture advisable, and report the result in the bulletins of the Department; and the Secretary of Agriculture, whenever he has reason to believe that such articles are being imported from foreign countries which are dangerous to the health of the people of the United States, or which shall be falsely labelled or branded, either as to their contents or as to the place of their manufacture or production, shall make a request upon the Secretary of the Treasury for samples from original packages of such articles for inspection and analysis, and the Secretary of the Treasury is hereby authorized to open such original packages and deliver specimens to the Secretary of Agriculture for the purpose mentioned, giving notice to the owner or consignee of such articles, who may be present and have the right to introduce testimony; and the Secretary of the Treasury shall refuse delivery to the consignee of any such goods which the Secretary of Agriculture reports to him have been inspected and analyzed and found to be dangerous to health or falsely labelled or branded, either as to their contents or as to the place of their manufacture or production, or which are forbidden entry or to be sold, or are restricted in sale in the countries in which they are made or from which they are exported. . . . ." (Section of Appropriation Act of March 3, 1905.)

The same act provides for an investigation of food preservatives in the following language:

"To enable the Secretary of Agriculture to investigate the character of proposed preservatives and coloring matters, to determine their relation to digestion and to health, and to establish the principles which should guide their use."

The results of the work were so satisfactory that laboratories were established in New York, San Francisco, Boston, Philadelphia, Chicago and New Orleans.

The Federal Food and Drugs Act was passed on June 30, 1906, and became effective January 1, 1907. The enforcement of this law was placed in the hands of the Bureau of Chemistry. Dr. Wiley was one of the three members of the special committee appointed to draw up regulations for the enforcement of the act. These regulations with minor changes in a few instances are still in force. Under this act the port laboratories referred to above remained in force, and numerous others were provided for at various ports of entry, as, for example, Savannah, Seattle, St. Louis, Detroit, etc. Thousands of foods and drugs have been examined under this act

and hundreds of successful prosecutions made. These prosecutions include some of the most flagrant frauds perpetrated on the public. For example, some of the so-called cancer cures, consumption cures, drug addiction cures, cocaine traffic, soothing syrups, etc. Dr. Wiley, through the drug division, has co-operated with the Post Office Department for the purpose of denying the privileges of the mails to numerous medicinal frauds, which is accomplished by the issuing of fraud orders by the Postmaster-General, after being satisfied that the parties engaged in the business are obtaining money by false and fraudulent promises and representations.

It will be seen that absolute unity of purpose and principle runs through Dr. Wiley's whole record, there is no wavering or hedging at any point. He has not only had the confidence of the people, but also of his colleagues engaged in scientific work. He was elected President of Section C of the American Association for the Advancement of Science in 1886; was Secretary of the Council of the American Association for the Advancement of Science in 1889, and General Secretary in 1891. He became President of the American Chemical Society during 1893–4, and was President of the Indiana Academy of Science in 1902. He was selected as the delegate from the United States to the second, third, fourth and fifth meetings of the International Congress of Applied Chemistry. He was a member of the Jury of Awards at the Universal Exposition at Paris, 1900. He also has been Professor in Agricultural Chemistry, Graduate School, Columbian University, since 1899. He received a medal of the first class of the Physicochemical Academy of Italy in 1908. He was made Chevalier Merite Agricole in 1900 and Chevalier Légion d'Honneur in 1909. He was the Honorary President of the International Congress for the Repression of Adulteration in Geneva in 1908. In May of last year he was elected the President of the U. S. Pharmacopœial Convention. He is the author of a number of books and has published some 60 government bulletins and 225 scientific papers.

This series of facts relating to the career of Dr. Wiley shows that he is a man who gets results. He is strong in physique and is a prodigious worker. That he knows how to get things done is not only manifest in the enactment of the Federal Pure Food and Drug Law, but in the enforcement thereof. The annual reports of the Bureau of Chemistry are simply staggering. In addition to the extensive investigations on important food and drug products car-

ried on by the department in Washington during the year 1910, and also in examination of about 20,000 samples, the following tabulated statement of the activities of the twenty-one branch laboratories is of interest as indicating in a general way the extent of the work done:

Laboratory	Imported samples			Hearings conducted	Interstate samples		Miscellaneous samples	Total samples analyzed
	Legal	Illegal	Floor-inspection samples		Legal	Illegal		
Boston	460	295	12,404	674	744	270	140	1,909
Buffalo	76	29	33	159	146	231	41	523
Chicago	173	125	2,572	365	658	686	42	1,684
Cincinnati	19	4	28	239	1,157	228	1	1,409
Denver	11	...	11	160	395	175	44	625
Detroit	52	4	92	359	151	144	31	382
Galveston	59	22	365	116	192	144	44	461
Honolulu[1]	272	144	677	131	...	...	8	424
Kansas City	...	...	...	103	125	127	...	252
Nashville	...	...	...	157	191	65	...	256
New Orleans	95	84	2,891	197	148	108	76	511
New York	2,382	1,632	47,821	1,779	124	297	504	4,939
Omaha	...	...	3	69	239	110	100	449
Philadelphia	569	183	5,250	293	41	114	48	955
Pittsburg	47	54	227	197	162	216	55	534
Portland	248	106	4,636	137	112	143	46	655
St. Louis	14	6	239	295	365	281	99	765
St. Paul	74	13	233	85	136	55	4	282
San Francisco	237	209	8,100	491	469	375	153	1,443
Savannah	65	40	26	159	105	51	19	280
Seattle	277	137	1,657	113	50	41	168	673
Total	5,130	3,087	58,726	6,278	5,710	3,861	1,623	19,411

[1] Owing to death of its chief, this laboratory was closed during the month of June; report is total for eleven months.

Dr. Wiley is not only a man of great executive ability but possesses a marvellous amount of patience. The Food and Drugs Act of June 30, 1906, became effective on the first day of January, 1907, and yet in his annual report to the Secretary of Agriculture on November 13, 1907, Dr. Wiley says:

"Previous to this date (January 1, 1907) it was necessary to carry out the provision of the law providing for the establishment of regulations. To this end a committee, consisting of H. W. Wiley, Chief of the Bureau of Chemistry, S. N. D. North, Director of the Bureau of the Census, Department of Commerce and Labor, and James L. Gerry, Chief of the Division of Customs, Treasury Department, acting for the Secretaries of Agriculture,

of Commerce and Labor, and of the Treasury, respectively, prepared a set of tentative regulations. Great care was exercised in *the preparation of these regulations, not only that the provisions of the law should be fully executed, but also that there should be no unnecessary annoyance or burden placed upon the trade.* It was deemed advisable before the promulgation of these regulations to hold public hearings in order to obtain the opinions of manufacturers and dealers. To this end, hearings were held in New York during the month of September, 1906, and were continued for a week. Upon the adjournment of these hearings the committee met frequently for the purpose of formulating the regulations, which were finally completed, signed, and promulgated on October 17, 1906, as Circular 21 of the Secretary's Office. As soon as these regulations were published a great flood of correspondence poured into the Bureau of Chemistry, necessitating a large increase in the clerical force. At the same time, also, arrangement was made for increasing the chemical force, to be ready for the increased activities of the work incident to the enforcement of the law on the first of January, 1907.

"Between January 1 and June 30, 1907, the personnel of the Bureau of Chemistry was more than doubled, the increase being divided between the clerical force, chemical assistants, and the corps of inspectors. The work incident to the enforcement of the law proved to be of far greater magnitude than had been anticipated, *and up to July 1, 1907, no actual prosecutions under the interstate feature of the law had been instituted. During this time, however, a much more rigorous execution of the law relating to imported foods was established.* This was possible because under the previous laws the machinery for the inspection and analysis of the imported foods had been already well organized. The only change which was made, therefore, in this service was to transfer the execution of the law from the clause in the appropriation bill provided therefor and place it directly under the Food and Drugs Act of June 30, 1906.

"It will not be out of place, however, to mention in this connection that, although up to the 1st of July no actual cases had been instituted in the courts under the Food and Drugs Act, *the moral effect of the act was apparent in every branch of trade connected with the food industry. One of the most gratifying features of this preliminary activity has been the almost unanimous support accorded by the trade to the principles of the act. In the majority of cases manufacturers of food products, as well as dealers therein, have expressed their cordial support of the act and offered their hearty collaboration in securing its enforcement. The importance of this fact can not be overestimated, since the difficulties of enforcing an act, if the entire food trade were opposed to it, would be practically insuperable."*[1]

I think it was the poet Whittier who said: "Young man, if you would be truly successful ally yourself with an unpopular but righteous cause." This was what Dr. Wiley did many years ago in the cause of pure foods and drugs, and in the prime of his life the dream of his youth has become a law. But he was not to stop

[1] *Italics by Editor.*

here, for he was charged with the difficult task of seeing that this law was judiciously administered. After five years it may be safely said that the fruits of his labors are enjoyed, not only by the general public, but have redounded to the advantage of the 98 per cent. of ethical business men in the United States as well as abroad.

HENRY KRAEMER.

AMERICAN PHARMACEUTICAL ASSOCIATION.

PHILADELPHIA BRANCH.

A special meeting of the Philadelphia Branch of the A.Ph.A. was held at the Philadelphia College of Pharmacy, in connection with the officers or representatives of a number of other associations and the colleges of pharmacy in Philadelphia, to take some action which would counteract the recommendation of the Committee on Personnel of the U. S. Department of Agriculture that Dr. Wiley "be permitted to resign" (see page 381). The President of the local branch, Dr. I. V. Stanley Stanislaus, presided, and asked Professor Kraemer to read the resolutions which he had prepared to be endorsed, if the members present so desired, and sent to President Taft. The following are the resolutions, which were read and unanimously adopted:

PHILADELPHIA, PA., July 17, 1911.

To the Honorable William H. Taft,
President of the United States.

The following preamble and resolutions, passed at a special meeting of representatives of the organizations named, are respectfully submitted for your consideration:

WHEREAS, We, the officers and representatives of the Pennsylvania Pharmaceutical Association, Philadelphia Association of Retail Druggists, Philadelphia Branch of the American Pharmaceutical Association and its Scientific Section, Philadelphia Branch of the American Chemical Society, The Philadelphia College of Pharmacy, Department of Pharmacy of the Medico-Chirurgical College and Department of Pharmacy of Temple University, in special meeting assembled, having learned that the Committee on Personnel of the United States Department of Agriculture has recommended that Dr. Harvey W. Wiley, Chief of the Bureau of Chemistry of that department, "be permitted to resign"; and

WHEREAS, The services rendered by Dr. Wiley, as chief chemist have been eminent and have revealed a progressive and liberal spirit, and have

furthermore been of great benefit not only to the agricultural interests of the country but to the American people as a whole; and

WHEREAS, Dr. Wiley was the chief promoter of the Federal Pure Food and Drugs Law, one of the most beneficent measures ever enacted by Congress, and has been untiring and fearless in carrying out its provisions since its adoption; and

WHEREAS, The drug trade generally throughout the United States has always had confidence in the integrity and ability of Dr. Wiley, and have endeavored in every manner to support his efforts in the wise and judicious administration of the Pure Food and Drugs Law; therefore, be it

Resolved, That we heartily endorse and commend the work which Dr. Wiley has done in securing the enactment of the Pure Food and Drugs Law, and in making the law effective since its adoption, which action has had a most wholesome influence upon the practice of pharmacy, both retail and wholesale; and furthermore, be it

Resolved, That we earnestly deplore any movement which would either cause Dr. Wiley to resign at this time, which it seems to us would be little short of a public calamity, or tend to hamper him in his efforts to make this law effective and thus render it a dead letter.

Brief addresses were made by the following: Mr. Ambrose Hunsberger, Prof. C. B. Lowe, Mr. Christopher Koch, Mr. C. Mahlon Kline, Mr. Joseph W. England, Dr. William D. Robinson, Prof. C. E. Vanderkleed, Mr. Wm. A. Carpenter, Prof. H. B. Morse, Prof. John R. Minehart, Mr. Wm. E. Lee, Mr. Wm. L. Cliffe, Mr. Charles Rehfuss, Mr. William McIntyre and Mr. Wm. Martindale.

BOOK REVIEWS.

ESSENTIALS OF VOLUMETRIC ANALYSIS. An introduction to the subject, adapted to the needs of students of pharmaceutical chemistry. By Henry W. Schimpf, Ph.G., M.D., Professor of Analytical Chemistry in the Brooklyn College of Pharmacy. Large 12mo. xiv + 358 pages, 61 figures. New York: John Wiley & Sons. Cloth, $1.50.

This is the second edition of this book. It has been largely rewritten and makes a good impression partly for the reason that emphasis is placed upon an understanding of the principles underlying volumetric analysis. The author has not adopted the easy method of clipping processes from the U. S. Pharmacopœia, but has

conscientiously digested the subject, and presented the results in a very creditable manner. The volumetric methods are arranged in a systematic manner and comprise alkalimetry, acidimetry, precipitation, analysis involving the use of silver nitrate, sodium chloride and potassium sulphocyanate. The oxidation methods involve the use of potassium permanganate, potassium dichromate and iodine. The reduction methods involve the use of sodium thiosulphate, arsenous acid and stannous chloride. There are also given concise descriptions of methods for assaying alkaloidal drugs, phenol, oils, sugars, formaldehyde, and alcoholic liquids, together with a few simple gasometric analyses, such as a pharmacist may find useful. The book ought to be in the hands of pharmacists generally, and we believe that even students in chemistry would find the book of considerable value.

HISTORY OF THE VEGETABLE DRUGS OF THE PHARMACOPŒIA OF THE UNITED STATES. By John Uri Lloyd, Pharm. M. This is Bulletin No. 18 of the Lloyd Library of botany, pharmacy and materia medica, published by J. U. and C. G. Lloyd, Cincinnati, Ohio.

The volume at hand brings to mind the quarterly publication entitled "Drugs and Medicines of North America," which was published by the Lloyd Brothers in 1884. This was an ambitious undertaking, and to pharmacists it was much like Gray's Flora of North America to botanists. Probably no two men were by nature and inclination as well as literary ability so well qualified to give a record of American medicinal plants including the history, botany, chemical constituents and pharmaceutical preparations as these authors. This work was suspended when No. 5 of Volume II was published in 1887. A few years later it was proposed largely as a result of the interest taken by Professor Flückiger in the subject, that a "Pharmacography of North American Medicinal Plants and Drugs" should be written conjointly by himself and Professor Lloyd. The death of Flückiger, however, terminated the enterprise, bringing to Professor Lloyd, as we can well understand, "one of the greatest disappointments of his life."

In the present volume the history of the vegetable drugs of the U.S.P. Eighth Revision are given. "Only enough is chronicled of each drug's beginning to point to the peoples or individuals who introduced it to medicine and pharmacy, no attempt being made to

follow the details of subsequent manipulations." A bibliography with over 700 references to books, monographs and articles completes this Bulletin. There are also included portraits of Dr. Rice and Professor Remington, the former being elected chairman of the Committee of Revision in 1900 and the latter Dr. Rice's successor.

This Bulletin contains very much valuable information and will not only be found useful as a reference book by the student but makes interesting reading. A rather curious omission is noted in the bibliography. While certain American medical journals are cited, the AMERICAN JOURNAL OF PHARMACY is not mentioned, although some references to Bastin's articles (as on p. 91) are given in the text and other references are made to this JOURNAL throughout the Bulletin. The same thing may be said of other publications, although fortunately the references are given in the text in connection with the discussion of the individual drugs. So that as a matter of fact the bibliography is much more extensive than would appear from the figures given.

HANDBUCH DER PHARMAKOGNOSIE von A. Tschirch. Lief. 22–25. Leipzig: Chr. Herm. Tauchnitz. Each Lieferung 2 marks.

In these brochures we have a continuation of the class of subjects introduced in the preceding Lieferungen and include the following: starch-yielding substances; inulin containing drugs; drugs containing triticin; polysaccharides occurring in membranes of plants as cellulose, lichenin substances, pectinous substances, mucilages and gums. The same high character of work is maintained and it is truly remarkable that it has been possible for Professor Tschirch to write so many original papers and publish at the same time this epoch-making book. It should be in the library of every pharmaceutical and medical school as well as in manufacturing laboratories. Of course pharmacognosists and food analysts are securing the Lieferungen as they are published, but owing to the general interest in many of the subjects treated, particularly by reason of the excellent illustrations, the latter half of the work might well be placed in technical schools, universities, and museums where raw materials are exhibited and studied, as well as employed for demonstration in connection with lecture courses. Botanists will find this work of Tschirch's like that of Wiesner's "Die Rohstoffe," and Czapek's "Biochemie der Pflanzen" of much value as a reference book.

PHARMAKOGNOSTISCHE RUNDSCHAU über das Jahr 1910. Bericht über die im Jahre 1910, periodisch erschienene Literatur aus dem gebiete der Drogenkunde und ihrer Hilfswissenschaften, von Prof. Dr. W. Mitlacher, Dr. O. Tunmann and Dr. M. Winckel. 1911. Verlag der *Pharmazeutischen Post,* Dr. Hans Heger, Wien, 1, Pestallozzigasse 6. $2.00.

It is rather stimulating to pharmacognosists to find that a volume of nearly 300 pages, containing a digest of the important pharmacognostical literature for 1910 is available in this form. In addition to some 50 pages in which are considered some general articles of a historical and special nature, abstracts of the various drugs are given under the respective plant families, and the latter are arranged in alphabetical order. The general disposition of the matter is such that it forms a very handy reference work. The abstracts are quite full and, having been prepared by specialists, contain all of the essential features. It is hoped that the sales of this work will be sufficiently great to warrant a continuation of its publication. When we consider the importance of the subject and the excellence of the work done, it would seem unnecessary to say that it is indispensable and should be in the libraries of our colleges and schools of pharmacy, and of botanists, pharmacognosists and food analysts.

REVUE DES MEDICAMENTS NOUVEAUX et de quelque médications nouvelles. Par C. Crinon. 18e Edition. Paris: Vigot Frères, Editeurs, 23, Place de l'Ecole-de-Medicine. 1911.

Among the new substances considered in the eighteenth edition of this work the following may be mentioned: Trichloracetylsalicylic acid, acoine, antodyne, asurol, bromhydrate of codeine, digistrophane, eulatine, hexamethylenetetramine-guiacol, pantopon, seiffenol, 606, tasi, thilavene and zincopyrine.

LECTURES ON COSMETIC TREATMENT. A manual for practitioners. By Dr. Edmund Saalfeld. Translated by I. F. Halls Dally, M.D., with an introduction and notes by P. S. Abraham, M.D. Paul B. Hoeber, 69 East 59th St., New York.

This work has been written apparently with the view that cosmetic treatment is for the regular practitioner and not for the so-called "beauty specialist." Professor Josef has well said: "The

subject of cosmetics has been too long neglected by the medical profession, and on this account has, unfortunately, passed into the hands of unqualified persons." It is probably true that a great many patients who could and should be treated by the general practitioner, if he only knew how, drift away from him and waste their time and money on various advertised nostrums or on other quackery. Dr. Saalfeld's book is written on strictly professional lines, and the work will no doubt prove useful to the general practitioner as well as to the dermatologist.

SOME COMMON REMEDIES AND THEIR USE IN PRACTICE. By Dr. Eustace Smith. Paul B. Hoeber, 69 East 59th St., New York.

Among the subjects treated in this volume are the following: On an Unjustly Neglected Remedy—Tartarated Antimony (tartar emetic); On the Internal Use of the Oil of Turpentine; On the Use and Misuse of Iron Remedies; On the Use of Alkalies in Practical Medicine; On Antispasmodics and the Cure of Spasm; On Some Uses of Opium; On the Use of Sodium Salicylate in Certain Serous Inflammations. The chapters making up this book are reprints of articles contributed to *The British Medical Journal* at intervals during the years 1908 and 1909. Their greatest interest lies in the fact that the author records his experience in using some of the standard medicines. Nearly every practitioner of experience could write a book of a similar character, and the young practitioner is the one who would be most benefited by a perusal of this work.

COMPTE RENDU DU XME CONGRÈS INTERNATIONAL DE PHARMACIE. Tenu à Brusselles du 1er an 6 Septembre 1910. Par Dr. A. Schamelhout. Brusselles: Imprimerie-Lithographie L. Vogels, Rue Verte, 48–50. 1911.

This volume contains an official account of the proceedings of the Tenth International Congress of Pharmacy held at Brussels during the first week of September last year. The papers which were read and the communications which were presented are printed in full. The discussions in connection with the various papers and reports are given in abstract and show careful editing upon the part of Dr. Schamelhout, the secretary-general of the Congress. An interesting account is given of the various excursions, fêtes and receptions that were held. In addition to the list of names of members of the Congress we find a number of photographs of those

prominent in the work of the Congress, as of the two Presidents, Dr. Albert Derneville and Dr. Olivier Kusnick; the Secretary-general, Dr. Albert Schamelhout; and the members of the Committee on Organization.

While the reports that have been published, particularly in the foreign journals (see also this JOURNAL, 1911, p. 24), show that the work of the Tenth International Congress of Pharmacy was eminently successful, it is still more apparent from the Proceedings at hand that a broad fraternal and international spirit dominated the entire meeting, and we feel sure that much good must redound to professional pharmacists throughout the world. The pharmacists of our country are encountering the same difficulties and are attempting to solve the same problems as those of other countries. In each country some progress is being made and it is quite possible for the pharmacists of one country to profit by the experiences of those in other lands, and thus eventually the best practice will be the universal practice. It is certain that we in the United States can profit much by the careful perusal of the deliberations of this Congress and, if we endeavor to catch the stimulating influence of the master minds who contributed to this session at Brussels, our professional and commercial work must be of a higher and more efficient character.

WALLACE PROCTER, PH.M. (1851–1911).

Wallace Procter, Ph.M., was born April 1, 1851, in Philadelphia, at the southwest corner of Ninth and Lombard Streets. He was the only son of William Procter, Jr., and Margaretta, his wife, whose maiden name was Bullock. (She was the first cousin of Charles Bullock, for many years the President of the Philadelphia College of Pharmacy.) Prof. William Procter had a daughter, Mary Goldsmith Procter, who married Samuel S. Green, and is now living at Barto, Florida.

Wallace was sent to private schools by his father for his early education. He then went to the Friends' Central School and graduated at the head of his class. He entered his father's store in 1868, and the next year matriculated at the College of Pharmacy. He successfully passed the examinations in the Junior course, and the following year he did not re-enter college, but acquired a practical knowledge of the drug business in the store. In October, 1871, he

entered the Senior course and graduated in 1872, winning the Alumni Gold Medal. "Magnolia Tripetala" was the subject of his thesis.

After graduation he assisted his father in the drug business, and on the death of his father on February 10, 1874, he entered into copartnership with David Preston, Ph.G. (1865), the firm's name being Wm. Procter, Jr., Co. This partnership continued till October, 1890, when Wallace Procter purchased from Lancaster Thomas the drug business at 1900 Pine Street. Here he remained in active practice for twelve years. On December 17, 1906, he entered the service of the Ohio Valley Drug Company, at Wheeling, West Virginia. He was given full charge of the laboratory and manufacturing department and he remained in this position until the day of his death, which occurred on May 27, 1911.

Wallace Procter was a devoted and earnest worker for his Alma Mater. He was elected a member of the Board of Trustees in 1883; and in 1888 he became a member of the Committee on Examinations, and its Chairman in 1890. His keen mind and comprehensive knowledge of pharmacy especially adapted him for this position. The questions which he propounded were always practical and thoroughly adapted to ascertaining the accuracy and extent of the knowledge of the student. He was no mere copier of old or revamped questions. He had but one thought in his mind, to develop the thinking qualities and reasoning powers of the student, and he attached very little value to mere memorizing. He served seventeen years in this capacity.

He was elected a member of the Committee on Instruction, and also of the Committee on Property; and in 1894 he became a member of the Publication Committee of the AMERICAN JOURNAL OF PHARMACY. In 1893 he was appointed a member of the Committee on Pharmaceutical Meetings of the College.

He was an active member of the Alumni Association; served as its Recording Secretary from 1876–1878, and was a member of the Executive Board for nine years. He was twice elected First Vice-President, 1878 and 1885, and became President of the Alumni Association in 1886. In 1887 he was re-elected member of the Executive Board, and continued in this capacity a number of years. Wallace Procter was one of the pioneer workers in this association, in the early days when this meant devoted and continued service under discouraging circumstances. He lived to see the association flourish and grow, and he was foremost in encouraging college spirit.

He became a member of the American Pharmaceutical Association in 1874, and a member of the Pennsylvania Pharmaceutical Association in 1881. He contributed many papers to the various pharmaceutical organizations and journals. Like his father he accepted service in many capacities where the sole reward was the simple satisfaction of doing good and advancing the interests of pharmacy.

Wallace Procter married Susan Ridgeway Shreve, of Mount Holly, New Jersey. It will be remembered that Mount Holly was the summer home of Prof. William Procter, and Wallace greatly enjoyed the freedom of a life in the open air, amid congenial surroundings of fruit trees, grape vines, and the sights and sounds of rural life. It was here that he met the maiden who was to become his wife, and who still survives him.

Three daughters remain to cheer their mother—Edith Harrison, Marian Grigg, and Margaretta Lippincott.

This simple record of the life work of Wallace Procter gives but a faint idea of his achievements. He possessed an excellent mind, developed by education and environment. In the latter years of his life he gave much time to books. He was an omnivorous reader, and all branches of pharmacy claimed his attention.

His admiration for his father and the great mission which the latter fulfilled were ever before him; and, while he did not inherit the love for original investigation which dominated Prof. Procter's personality, Wallace had an analytical mind and never trusted to surface indications. The son practised what the father taught, and added knowledge fitted for his time and generation.

When he transferred his activities from Philadelphia to Wheeling, his quiet unobtrusive manner and his genial qualities soon endeared him to a host of friends. Further acquaintance added to his popularity, and the Ohio Valley Drug Company sent Wallace Procter to the State association meetings as their representative, and he became one of the most valued members of the Virginia Pharmaceutical Association.

On May 9, 1911, he suffered a stroke of paralysis. His physicians, realizing that his condition was serious, recommended a return to his native city; and upon the arrival of his wife, the sad journey from the hospital, at Wheeling, to Philadelphia was accomplished; and though under distressing circumstances, it was cheered by the reflection that his friends turned out en masse at the home and in the railroad station, and did everything in their

power to testify to the devoted wife the honor and the affection which Virginians always exhibit to those whom they love and trust.

Wallace Procter died on May 27, 1911, and the Board of Trustees, and his college friends in Philadelphia, were present at the last sad rites. He was laid to rest beside his father in Mount Holly, the beautiful place which had witnessed more days of real happiness to both than any other spot on earth.

J. P. R.

THE PHILADELPHIA COLLEGE OF PHARMACY.

QUARTERLY MEETING.

The quarterly meeting of the members of the College was held June 26th at 4 P. M., in the Library. The President, Howard B. French, presiding. Fifteen members were present. The minutes of the Annual Meeting held March 27th were read and approved. The minutes of the Board of Trustees for the meetings held March 7th, April 4th and 11th, May 2d and 16th, were read by the Registrar, and approved. The Report of the Committee on Membership was read by Prof. C. B. Lowe, Chairman. Some statistical information is given in the report and mention made of a number of members who are in arrears for non-payment of annual dues. The members are urged to interest those deemed worthy of membership to have them unite with the College.

The Report of the Committee on Necrology was read by Prof. Henry Kraemer. Since the last report three members have died. Caleb R. Keeney died February 1st, 1911—a graduate of the class of 1846. He joined the College in 1852. He was the oldest graduate and at the same time one of the oldest members.

Thomas M. Newbold, died April 2d, 1911. Joined the College in 1871.

Wallace Procter, died May 27th, 1911. Joined the College in 1874. He was the son of the late Professor William Procter.

The College has lost through the death one of our Honorary Members, Professor Attfield (see this JOURNAL, p. 358).

Another name worthy of mention, although not a member of the College, was one of its most distinguished graduates, Professor Carl S. N. Hallberg.

The Historical Committee, through its Chairman, George M. Beringer, reported that they had not been unmindful of their duties,

but as most of the members of the Committee were also members of the College Committee on the revision of the United States Pharmacopœia that much of their time of late has been occupied with that work.

The Committee on By-Laws, to whom was referred the suggestion to change the time of holding the Pharmaceutical Meetings, reported an amendment to Article XI, Section 1. Action upon which lies over till the next meeting of the College.

The Report of Delegates to the 34th Annual Meeting of the Pennsylvania Pharmaceutical Association held at Bedford Springs, June 20th to 23d, was presented by Professor Lowe. Among the valuable reports were those on "Adulterations" and "Trade Interests," both of which were quite full and of great interest. The report of the Committee on Legislation, by its Chairman, John C. Wallace, aroused much interest. The Pharmacy Bill as amended was referred back to the Committee on Legislation with instructions to prepare a bill and submit to the members one month prior to the next Annual Meeting. Some 30 papers were presented by the Committee on Papers and Queries. The prize of $20 for the best paper read at the previous meeting was awarded to Mrs. C. H. La Wall.

Mr. J. L. Lemberger was elected President. Of the nine appointed delegates, six were present. So many of the graduates of the College were in attendance that the meeting almost looked like an Alumni reunion.

The next meeting of the Association will be held at Buena Vista.

The report of Delegates to the New Jersey Pharmaceutical Association was read by Mr. George M. Beringer, Chairman.

The Annual Meeting was held at Asbury Park, N. J., June 13–16. There was an address of welcome by the Mayor of the city. A proper recognition of "Flag Day" was shown by draping the presiding officer's desk with Old Glory, and the entire Association joining in singing the "Star Spangled Banner." Four of the delegates from the College attended the Meeting and were cordially welcomed. The meeting this year was notable for increased attendance and interest in the proceedings. The papers were more numerous and varied. Professor Kraemer contributed a very interesting paper on the Pharmacognosy and History of the Echinacea. The other papers presented and discussed were on Standard Surgical Dressing, by Mr. F. B. Kilmer; Review of the German

Pharmacopœia, by George M. Beringer, Ph.M.; Window Dressing by Mr. Holzhauer; Neutral Suspension of Salvarsan, by Mr. George M. Beringer, Jr.; Official Pepsin Preparations and Official Iron Preparations, by P. E. Hommel; Calx. U. S. P., by Prof. Chas. H. La Wall. The greatest interest was manifested in the discussion of a proposed new Pharmacy Act for the State. A draft of a proposed bill was presented in printed form as a basis for the discussion. The Association expressed itself as to the principles to be included in a new Pharmacy Act to be presented to the next session of the Legislature. This included a "prerequisite" clause as a leading feature. On the whole the meeting this year was considered a very successful one and fraught with possibilities for many pharmaceutical advances.

The President made the following appointments:

Delegates to the American Pharmaceutical Association Meeting to be held in Boston, August 14–18; Joseph P. Remington, Henry Kraemer, C. B. Lowe, A. W. Miller, George M. Beringer.

Historical Committee: George M. Beringer, Jacob M. Baer, Henry Kraemer, Warren H. Poley, C. A. Weidemann.

Committee on Necrology: Henry Kraemer, E. M. Boring, C. A. Weidemann.

Committee on Nominations: William L. Cliffe, Charles H. La Wall, James C. Perry, Theodore Campbell, George B. Weidemann.

Professor Kraemer proposed the names of two gentlemen for Honorary Membership. According to the rules action is deferred till the next meeting of the College.

Professor Kraemer referred to the death of Wallace Procter, who was for many years a member of the College and of the Board of Trustees, and moved that a committee of three be appointed to draft suitable resolutions to his memory, which being agreed to, the President appointed as members of the Committee: Joseph P. Remington, Joseph W. England and C. A. Weidemann.

ABSTRACTS FROM MINUTES OF THE BOARD OF TRUSTEES.

March 7th. Sixteen members present. Committee on Library reported 1350 accessions (old and new books) from October 26th to February 1st. Many of the cases had been cleaned. 132 persons had used the Library during the month. Committee on Examina-

tions reported that Edward C. Denzler had successfully passed the examination for the Certificate of Proficiency in Chemistry, and was awarded the Certificate.

Committee on Announcement asked that they be authorized to issue a hand-book of condensed information for the use of prospective students. Such a book had been prepared and the Committee was given the power to issue two thousand copies.

The merger of the "Alumni Report" with the "Bulletin" had been very favorably received, and it was believed the change would prove a beneficial one.

April 4th. Fourteen members were present. J. L. Lemberger presiding. A communication from the Secretary of the College was read reporting the names of the officers of the College and three members of the Board elected at the Annual Meeting of the College, held March 27th, 1911. Upon organization of the Board, Mr. George M. Beringer was re-elected Chairman, and Walter A. Rumsey, Vice-Chairman, for the ensuing year. Jacob S. Beetem was re-elected Registrar. The standing committee for the ensuing year were announced by the Chairman. Committee on Library reported 286 accessions; 325 persons had used the Library during the month.

April 11th. Sixteen members present. Committee on Instruction presented a lengthy report covering the work of all the departments of the College in detail and making a number of recommendations, which were acted upon separately and adopted with slight alterations in several of them. The Committee on Appropriations reported the various estimated amounts to be allowed the Committees and Departments authorized to make expenditures.

May 2d. Sixteen members present. Committee on Library reported 313 books stamped, classified and shelf-listed, and that 192 persons had used the Library during the month.

Committee on Examinations reported Charles Duvoisin as having passed the examination for Certificate of Proficiency in Chemistry and therefore entitled to the certificate, which was awarded him.

May 15th. George M. Beringer, Jr., was elected to active membership. Seventeen members present. Committee on Examinations reported the names entitled to the degree of Doctor in Pharmacy, Pharmaceutical Chemist, and Certificate of Proficiency in Chemistry and Pure Food and Drug Course, and recommended their election. A ballot being taken they were declared elected.

The award of prizes to those entitled to them was announced, as also the various speakers who were to present the prizes to the recipients on the night of the Commencement.

Committee on Commencement reported that Prof. Willis L. Moore, Chief of the Weather Bureau, had kindly consented to deliver the annual address.

C. A. WEIDEMANN, M.D.,
Recording Secretary.

CORRESPONDENCE.

BOARD OF TRUSTEES, UNITED STATES PHARMACOPŒIAL CONVENTION.

The General Medical Convention edited and published the first Pharmacopœia in the series of what is now known as the Pharmacopœia of the United States of America. It was published in Boston, December 15, 1820. The convention provided for the revision of the Pharmacopœia in 1830, the convention being then known as the National Medical Convention. The same name was applied to the conventions of 1840 and 1850. In 1860 the name was changed to the National Convention for Revision of the Pharmacopœia. In 1900 the name was again changed to the United States Pharmacopœial Convention, which was duly incorporated. Prior to 1900 business matters, as well as the work of editing, were taken care of by the Committee of Revision. With the incorporation in 1900, business affairs were separated from the work of revision and placed in the hands of a Board of Trustees, having the management of affairs and funds of the convention. The By-laws provide that the Board of Trustees shall transact business involving financial or other matters that may be for the best interests of the convention, and perform such other duties as the convention may from time to time direct. The following is the Board of Trustees, as constituted by the convention of May, 1910:

James H. Beal (Chairman), Henry M. Whelpley (Secretary), Frederick W. Meissner, Jr., William Jay Schieffelin and George H. Simmons. Joseph P. Remington and Harvey W. Wiley are ex-officio members. The officers were re-elected for the ensuing year.

The Board held its first annual meeting for the decennial period, 1910–20, at Philadelphia, May 5 and 6. All members were present.

The Board appropriated funds for use in paying necessary expenses in the work of revision incurred by members of Executive Committee under the direction of Chairman Remington.

The Board decided to withdraw from sale those copies of the U.S.P. VIII in which additions and corrections have not been incorporated in the text.

An inventory has been prepared of all of the articles of permanent value purchased since 1900. A record is being made of the location and condition of these articles.

Insurance has been taken out on the electroplates for both the Spanish and English editions which are in the hands of the publisher. Also, on the copies of both the English and Spanish editions which are on sale in the hands of agents.

An auditing committee examined the accounts of the Treasurer, Samuel L. Hilton, and Secretary of the Board, H. M. Whelpley, and found the same correct. Expenditures are first authorized by the Board and the bills approved by the person under whose supervision the expense is incurred. All bills are next sent to the Secretary of the Board to be audited. The Secretary then issues a voucher check which he signs and forwards to Chairman Beal, who in turn signs and forwards the voucher check to Treasurer Hilton, who signs same and mails it to the payee. The original bills with notations are preserved with the records of the Secretary of the Board. The Treasurer of the Convention and the Secretary of the Board keep duplicate accounts of receipts and expenditures, as shown by the voucher checks. The following is a summary of the same for the fiscal year just closed (May 1, 1910, to April 30, 1911):

RECEIPTS.

May 23, 1910, To balance from Treasurer 1900–1910....	$8394.01
May 23 to April 30, 1911, Sales English Edition.....	6188.02
May 23 to April 30, 1911, Sales Spanish Edition.....	1169.35
May 23 to April 30, 1911, Receipts from Use of Text....	290.00
July 1, 1910, Interest on Deposits, American S. & T. Co..	88.91
January 3, 1911, Interest on Deposits, American S. & T. Co.	83.02
Total Receipts	$16,213.31

EXPENDITURES.

1910–11. Expenses 1910 Convention.—Supplies, $79.70; printing, $53.25; general, $15.73; stenographic report, $375.38; clerical, $198; abstract, $345.17; total, $1067.23.

I. Revision.—Clerical, $1847.50; meetings, $13.89; supplies,

$1140.97; postage and telegraph, $146.88; experts, $52.60; general, $112.67; total, $3314.51.

II. Publication and Sales.—English edition, $1952.56; Spanish edition, $271.12; general, $9. Total, $2232.68.

III. Administration.—Meetings, $330.10; clerical, $666; supplies, $154.65; postage and telegraph, $67.50; general, $41.53. Total, $1259.78. Grand total, $7874.20.

Cash on deposit American Security Co., to balance, as shown by Treasurer Hilton's books and verified by the bank, $8339.11.

HENRY M. WHELPLEY,
Secretary Board of Trustees, U.S.P.C.

KENTUCKY AGRICULTURAL EXPERIMENT STATION.

To the Kentucky Retail, Wholesale and Manufacturing Druggists:

Two years' work under the Kentucky Food and Drugs Act has convinced those engaged in the enforcement of the drug sections of that Act, that there are two classes of adulteration: first, adulterations due to wilful intent or gross carelessness; second, adulterations due to various trade and professional problems, which this office believes can be better overcome through mutual assistance rather than prosecution.

For the purpose of introducing educational and co-operative methods with respect to the second class problems, this Division proposes to conduct a short term school for druggists and others engaged in the drug business, of about ten days' duration, during the last of April or the first of May. It is proposed to take up at this school the following subjects: (*a*) The general application of the State and Federal pure food laws for the drug business; (*b*) the drug regulations and notices of judgment under the Federal law; (*c*) the regulations under the State law; (*d*) the proper labelling of patent and proprietary medicines under the law; (*e*) the proper labelling of U.S.P. and National Formulary products under the law; (*f*) necessary equipment for a druggist's laboratory; (*g*) drug store management and equipment; (*h*) problems connected with the preparation, storage and handling of various pharmaceutical preparations; (*i*) standard weights and measures; (*j*) the soda fountain; (*k*) other similar subjects.

These matters will be presented by the experts of this office

and by pharmacists who will be invited to assist. The Division also proposes to invite the manufacturers of some of the pharmaceuticals with which druggists have difficulty, to send their chemists or manufacturing managers to give special lectures with respect to the proper treatment and handling of such products.

This office would like to have your views of the school, and the plan outlined above, with any further suggestions, as to whether or not anyone connected with your firm will attend, and as to the best date.

A blank for reply is enclosed herewith. Please answer at your earliest convenience. Respectfully,

R. M. ALLEN,
Head of Division.

March 22, 1911.

AMERICAN JOURNAL OF PHARMACY,
Philadelphia, Pa.

GENTLEMEN: Enclosed find three resolutions adopted at the last meeting of the Pennsylvania Pharmaceutical Association.

The one regarding the Pure Food and Drugs Act and also the one concerning Dr. Wiley are particularly pertinent at the present time, in view of the activity of the food and drug "Dopers."

These resolutions have been sent to the President of the United States, the Senators from Pennsylvania, and the Congressmen from the State of Pennsylvania.

Thanking you for your uniform courtesy and assistance,

Very sincerely yours,

E. F. HEFFNER,
Secretary.

July 21, 1911.

Resolution: We, the members of the Pennsylvania Pharmaceutical Association, in convention assembled, do hereby

Resolve, That we place ourselves on record as favoring such necessary amendments to the Federal Food and Drugs Act of June 30, 1906, as will prevent the misbranding of food and drug products either as to composition, curative action or in any other particular.

Resolution: We, the members of the Pennsylvania Pharmaceutical Association, in convention assembled, do hereby

Resolve, That we disapprove of and denounce the underhanded and unfair methods which have recently been used by the organization called the American Protective Association in attacking Dr.

Wiley, who has so fearlessly fought for honest standards in both foods and drugs; for, while many persons may honestly object to certain rulings and proceedings brought under the Federal Food and Drugs Act, we believe that such objections as are meritorious and such opposition as is worthy of support should be brought in an open and fearless manner and without subterfuge.

Resolution: Whereas, there is pending in Congress an act known as "The Sherley Bill," H.R. No. 8,887, under the provisions of which it is proposed to levy a stamp tax of 2½ per cent. based upon the retail price of so-called "patent" or "proprietary" medicines and all toilet preparations of a proprietary character, and

WHEREAS, Experience has demonstrated that this burden will fall heavily upon the retail druggist because the added cost cannot be passed to the consumer as the retail price is fixed by the manufacturer, and

WHEREAS, The only medicines that are really patented, viz., the various imported and domestic synthetic products will not come under the provisions of this act, for reason that they are classified as uncompounded medicines upon which this tax would not be levied; therefore be it

Resolved, That we, the members of the Pennsylvania Pharmaceutical Association, in convention assembled, do solemnly protest against the enactment of this measure, believing it to be a direct tax upon a single class of business, and therefore burdensome and unjust.

PENNSYLVANIA PHARMACEUTICAL EXAMINING BOARD.

LICENSED AS PHARMACISTS.

Announcement was made by the State Pharmaceutical Examining Board on July 6th that 334 out of 450 applicants for State licenses had been successful, the number qualifying as pharmacists being 199 and as assistants 135.

Philadelphians who passed the examinations are:

Pharmacists: Samuel Baradofsky, William D. Baun, Jennie Bellitz, Louis Bell, Meyer Bloomfield, Frank E. Houston, De Wilton S. Berry, Samuel J. Brahin, Osher Briskin, Robert O. Bricker, Lloyd Burtt, Franklin C. Brush, Louis E. Christopher, Philip Cohen, D. Wayne Darrah, Charles C. Eberly, David W. Eisman, Lewis Fleisher, Nathan M. Friedman, Walter J. Gaskill, Samuel Glick,

Jacob Goldberg, Charles S. Gutzeit, Morris Haimowitz, Gerald J. Harrigan, Max Heller, Carl F. Kaehler, Nathan Kaufman, John L. Kooker, Jr., James Kramer, John F. Kratz, Harry Lashinsky, Rebecca Levy, Andrew F. Lippi, Michael J. Lovenstein, Francesco Megaro, Samuel Millrood, Louis H. Myers, Mabel Nelson, Lewis W. Oswald, A. A. O'Daniel, John M. O'Donnell, Geo. W. Patterson, Jr., Benjamin Promisloff, John W. L. Purcell, Albert Rachmil, Julius Rapaport, Nathan Rosensweet, Samuel Rosin, Leon Ross, Thomas B. Tanner, Isador P. Salinsky, Fred A. Schuenemann, Edward Seldes, Nathaniel J. Segal, Stanley A. Shiles, Samuel A. Silk, M.D., Israel Spiers, Ethelbert Steelman, Morris Stein, William H. Sternthal, William H. Udell, Lewis Viner, Llewellyn J. Watkins, E. Leonard Weiszgerber, Leon M. Wolchek, Harry Woorman, Jos. L. Murray.

Qualified Assistants: Gerson Azoff, Rose Blieden, Maurice Brown, Herman J. Broude, Charles A. Buohl, Herbert H. Boyer, Ernest Bernabei, F. W. Campbell, Joseph Duffy, James T. Fiedler, Harry Friedman, M. S. Glauser, Herman Leo Hinski, Ralph A. Hurley, William F. Kalesse, Karl Krogh, Albert F. Keller, Morris I. Lopoten, Jacob Lubin, Moses Minzes, Myer Matrick, Patrick P. Maloy, Fred W. Martin, Leah Nichols, Esther Nicholas, H. E. Newton, Blair G. Rumsey, L. E. Rothberg, C. J. Rabin, Clifford Raser, Henry L. Reinish, Hyman B. Stern, M.D., Sol. E. Streitfeld, C. B. Sterner, J. Harry Swain, Edison Shoemaker, Henry A. Stauffenberg, Tany Taboror, Anna Teller, B. O. Tegge, John Thomas, Antonio Venuto, David Weinberg, Hirsh Wilderman, W. S. Wignall, Reuben L. Walton, O. W. Wickham, Charles H. Yeagle, and Nathan Zonies.

The colleges of pharmacy and the number of applicants from each who graduated in 1911 and took the examinations for applicants desiring registration as pharmacists, were as follows:

Philadelphia College of Pharmacy, 70, of which 66 passed the examination and 4 failed; Medico-Chirurgical College, department of pharmacy, 34, of which 28 passed and 6 failed; University of Pittsburg, department of pharmacy, 44, of which 42 passed and 2 failed; Temple College, department of pharmacy, 15, of which 14 passed and 1 failed; Brooklyn College of Pharmacy, 1 applicant and 1 successful.

The next examinations given by the board will be conducted in the Williamsport High School, Williamsport, Pa., on August 24 and 25.